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The second part of the volume gives a bibliographical list of 2871 titles to April 1, 1898, with a special index. As a frontispiece the volume shows a portrait of Kölreuter. There are 81 figures, most of which are familiar to those who have used Müller's *Befruchtung*. Fig. 1 is a reproduction of the title-page of Sprengel's *Entdeckte Geheimniss*.

The second volume considers the results of observations made in Europe and in the Arctic regions; of Aurivillius and Ekstam in Nova Zembla; Burkill, Scott-Elliott and Willis in Great Britain; Delpino, Comes, Nicotra and Ricca in Italy; Dalla Torre, Kerner and Schulz in the Tyrol; Heinsius in Belgium; Kirchner at Stuttgart; Loew in the Berlin Gardens; Lindman in Greenland and Scandinavia; MacLeod in Flanders and Pyrenees; Müller in Westphalia, Thuringia and Alps; Verhoeff in the West Frisian island, Norderney; Warming in Greenland and Denmark. The first part includes the families Ranunculaceæ-Compositæ. A contemplated third volume relates to investigations made in other parts of the world. The whole ground is gone over in so thorough a manner that it will not be necessary for contributors to go through so much drudgery in looking up the literature, nor will it leave much excuse for offering contributions which have no relation to the present state of what is called "our knowledge."—CHARLES ROBERTSON.

Fungicides and insecticides.

IT HAS BEEN but a few years, scarcely more than a dozen, since the range of fungicidal agents embraced little more than bluestone for steeping wheat, sulfur for dusting upon foliage, and a somewhat uncertain application of copperas. But in these last years the number of effective fungicides has become exceedingly large, and their specific application is now based upon extensive study of underlying causes and conditions. The history of insecticides and their use is very similar. One has only to consult the excellent treatise by Lodeman on the spraying of plants, published two years ago, to feel that the amount of practical knowledge the scientist now lays before the cultivator in a field where his needs are great is of astonishing proportions. The United States has borne a proud part in the development of this subject, being in fact an acknowledged leader, while France, Italy, Switzerland and Germany have, in the order named, become actively interested in vegetable pathology and prophylactic measures.

Germany, although somewhat tardy in taking up this department of investigation, now puts forth a volume on the methods of combating plant diseases by means of chemical preparations that will prove of interest to all students of the subject, as well as to the cultivators and investigators of Germany for whom it was prepared. It emanates from Halle, that city of experiment stations, and is written by Dr. M. Hollrung,⁵ director of the

⁵HOLLRUNG, M.: Handbuch der chemischen Mittel gegen Pflanzenkrank-

experiment station for plant pathology of the agricultural bureau of Saxony.

The work is compiled from all available sources, American methods being extensively quoted. It devotes three pages to preparations in which the chief ingredients are of animal origin, such as fish oil, lard, soap and glue; twenty pages to those with vegetable substances, such as cotton-seed and other plant oils, resin, tar, pyrethrum, tobacco and hellebore; and the remainder of the work, 141 pages, to those with mineral ingredients. Although primarily a volume of recipes, the metric system of weights and measures being exclusively employed, yet their uses and methods of application are clearly and succinctly set forth, with an estimate of their efficiency, and references to the source of information.

The work is admirably conceived and executed, and as closely up to date as any general work is likely to be. The classification makes it handy for reference, which is further aided by a full index.—J. C. A.

Bryology of Madagascar.

SINCE THE publication in 1879 of Bescherelle's *Florule bryologique de la Réunion et autres îles austro-Africaines de l'Océan Indien*, a number of papers on the mosses of Madagascar and allied regions have been published by Müller, Bescherelle, Brotherus, Wright, Mitten, Warnstorff, Renauld, and Cardot. Collections by French officials, missionaries, and others have accumulated. M. F. Renauld has sought to bring all this scattered information together in a sumptuous volume published by order of Prince Albert of Monaco.⁶

In preparing this work he has had abundant cooperation of bryologists who have been working in this field, or those who have charge of collections from South Africa. A preface on the generic nomenclature and the value of specific characters contains nothing novel. The geology, topography, and climate of the islands are briefly described. The chapter on the distribution of the mosses is very unsatisfactory because knowledge of the region is still much too imperfect to allow adequate treatment. M. Renauld calls the bryological flora south tropical; holds that the islands constitute an independent domain, each island having its own individuality but unequally marked; and sees relations on the one hand with the flora of the Indo-Javanese archipelago through allied species, and on the other with that of the mountains of South Africa both by allied and by identical species.

The flora of the whole group is enumerated as follows: *Acrocarpi* 413, *heiten*; *Herstellung und Anwendung in Grosse*. 8vo. pp. xii + 178. Berlin: Paul Parey. 1898.

⁶RENAULD, F.—*Prodrome de la flore bryologique de Madagascar, des Mascareignes et des Comores*, publié par ordre de S. A. S. le Prince Albert I^{er}. Ouvrage couronné par l'Institut de France. Small 4to. pp. viii + 300. Monaco. 1897.